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## Understanding the management of personal records at home: a virtual guided tour

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**Introduction.** This paper considers how we can better manage personal records in the home by addressing questions such as how and why personal records are retained in an electronic form and how they are managed.

**Method.** A qualitative method with semi-structured interviews was used. Participants were recruited through social media. The interviews included virtual guided tours of personal records. There were thirty participants in twenty-two interviews (some interviews were with couples).

**Analysis.** Each stage of the personal records management process described by participants was observed and categorised, resulting in an inclusive flow diagram.

**Results.** The management of personal records at home can be categorised and described in terms of a flow. Some commonalities were found between personal information management in the workplace and at home, such as the frequent use of e-mail to manage records and the use of micro-notes and reminders.

**Conclusion.** Personal records management at home can be described as a flow through which records progress. The fact that the study of personal information management has rarely addressed personal information management at home offers many opportunities for fruitful future research.

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## Introduction

This paper evaluates how we can better manage personal records at home by exploring how and why personal records are retained in an electronic form and how they are currently managed. We build on the field of study that investigates personal information management which focusses mostly on personal information management in the workplace.

Managing personal records at home is important to ensure that bills are paid on time, appliances can be repaired while still under warranty, motor vehicles are registered and insured, health records are retained, tax

obligations and deductions are honoured, and important documents (such as birth certificates and passports) and evidence (such as records of payment) can be found. This paper reports on exploratory research into how people manage their personal records at home, drawing on experiences and methods used in personal information management research.

Studies in personal information management usually focus on how to effectively manage and share digital information retained in the workplace, particularly amongst knowledge workers (Buttfield-Addison, [2014](#); Henderson, [2004a](#); Oh, [2013](#)). Despite extensive literature on personal information management, only a few studies have been conducted on how information and documents are managed at home (Dinneen and Julien, [2019](#); Kalms, [2008](#); Lush, [2014](#); Oh and Belkin, [2015](#)) and most of these focus on specific items including photographs (Whittaker et al., [2009](#)), recipes (Hartel, [2010](#)) and wedding planning (McKenzie and Davies, [2010](#)). There is little research about how the broad range of information and documents, including personal records, are managed in the home. This research aims to fill that gap.

As to the forms of personal records we might expect to find at home, in an exploration of the ontology of documents, Smith ([2011](#)) provides examples of thirty-six common documents in the personal sphere, including marriage licences, birth and death certificates, insurance documents, tax forms, and payslips. There are also micro-notes and reminders, such as to-do lists, appointment reminders, and things to remember such as passwords and phone numbers (Lin et al., [2004](#), p. 687). There are many examples of personal records but no broadly recognised definition or categorisation of personal records.

The study of personal records at home is similar to the study of personal information management in the workplace, in that we deal with a broad mixture of loosely defined items, the electronic versions of which are typically stored in e-mail, computer folders or in the cloud. Just as personal information management studies how people manage personal information in the workplace (but does not study purpose-designed workplace databases), so personal electronic records management relates to records that are organised by people at home in the way of their choosing and excludes records placed in purpose-built software. We acknowledge that there is an extensive repertoire of specialist software, such as tools for storing and tagging photos, music, health tracking, recipes and so forth, however applications for specific types of personal collections are not the subject of this research because each of these will have features only applicable to one kind of collection. Like the study of personal information management, our interest is in how, as McKenzie and Davies phrase it, people '*keep... track of what needs to be done ... the documentary tools used to coordinate the work of keeping track in everyday life...*' (McKenzie and Davies, [2012](#), p. 437).

The aim of this exploratory research is to understand personal records management in the home and how this may be similar to or different from information and document management in the workplace. While studies conducted in the workplace mostly address the challenge of how people store, save or find electronic information, our focus is on people's behaviour in managing their personal (including household) records, as opposed to discussing the nature of the records themselves, and includes both paper and electronic records. Insights from this study will be useful for people seeking to improve records management in the home. Personal records that are retained in an electronic format can be given filenames, sorted into folders, or, depending on the software used, catalogued with descriptors, often referred to as metadata (Eden, [2002](#)) or tags (Civan, et al., [2008](#)). The overarching research question is: how is personal records management conducted in the home? In order to understand this, we investigate:

- How can we understand the mix of hardcopy and electronic information and documents at home?
- Are there similarities in home information and document management to workplace personal information management (for example in e-mail management and micro-note taking)?
- What behaviour and practices can be identified that will enable people to improve their home information and document management?

## Related work

The study of personal records at home can be conducted at the individual level, or amongst multiple members of the household (we adopt the word household to reference people's activities at home, inclusive of people living alone or any other household structure), depending on who is involved and how the tasks are shared. This is similar to personal information management studies in the workplace, where research is conducted at an individual, team or organizational level. On occasion, researchers in personal digital archiving have

discussed the roles of different people within a family, but rarely in the context of household members concurrently managing information as a team, rather in the context of the documentation passed from one generation to another (see, for example, Banks, [2020](#); Drosopoulou and Cox, [2020](#); Massimi et al., [2010](#); McKemmish, [1996](#)).

## Personal information management

There are many studies of behaviour and practices in personal information and document management in the workplace and models of information and document management that may be useful for understanding records management in the home. Many address how files are saved and re-found, finding that documents in the workplace are typically re-found by navigating to them in a folder tree, see for example: Alon and Nachmias ([2020a](#)), Bergman et al. ([2019b](#)), Bergman et al. ([2021](#)), Gao ([2011](#)), Henderson ([2009b](#), [2011](#)), and Henderson and Srinivasan ([2011](#)). Barreau and Nardi ([1995](#), p. 3) described how users in the workplace tend to search for files by browsing folders (or directories, as they were known at the time), characterised by the question, ‘*What did I call that file?*’. Twenty-five years later, researchers are still trying to determine why people struggle to re-find files when they need them (Bergman et al., [2021](#); Bergman et al., [2019b](#)).

The challenge of hierarchical file structures is that they force electronic documents to be categorised into a single folder unless they are duplicated, and links or shortcuts have not been widely adopted as an alternative (Huynh et. al, [2002](#)). This has led to studies exploring the scope for a multi-classification (Henderson, [2005](#); Karger, [2007](#); Russell and Lawrence, [2009](#)). Research during the late 1990s and the 2000s developed classifications of personal information management behaviour which applied to both the structure of saved files and the organisation of e-mail folders. This research explored how people saved documents within a hierarchical folder structure (see for example: Alon and Nachmias, [2020b](#); Barreau, [1995](#); Henderson, [2004b](#); Oh, [2012a](#); Whittaker and Massey, [2020](#)). In hierarchical systems, users are confounded when trying to file information that does not fit into their existing folder categories or fits into several categories (Oh, [2012a](#)). The outcome has been a high level of duplication of files and file names across folders (Henderson, [2011](#)). A quarter or more of personal file collections have been found to be duplications (Dinneen and Julien, [2019](#)). The converse issue is whether people think to save records that they may need in the future. In their book, *Personal Information Management*, Eztel and Thomas ([1996](#)) observed that, for each record or category of records, users are required to determine whether ‘*I will need this again*’, or ‘*I might need this again*’ and so on. Hence personal document collections may suffer from both omissions and duplication.

A personal information management experiment that may be applicable to home-based records management was conducted using placeless documents, a prototype file-management infrastructure that used active properties (user-created descriptors or tags) as an alternative to folders. Placeless Documents used metadata to associate additional information about the content of the files with each of the files. It comprised both system-created attributes such as a date, and descriptive user-designated properties, which allowed users to add whatever descriptive terms they wished. The replacement of the hierarchical folder structure with multiple properties also meant that files could be described differently by different users, without duplication of the files. Placeless Documents foundered because the project paid insufficient attention to how it would work in with other software and practices. The conclusion was that there was a need to consult with other software providers in the process of developing such a system (Dourish, [2001](#); Edwards et al., [2003](#)). This demonstrates that software solutions designed to improve document or records management need to consider the implications of the system to ensure seamless capability with other software.

Many personal information management studies have addressed the topic in terms of where records are saved, suggesting a largely static environment, wherein files are received or created and saved directly to where they are stored (Al-Omar and Cox, [2013](#); Albadri et al., [2016](#); Bergman and Whittaker, [2016](#); Boardman and Sasse, [2004](#); Dinneen et al., [2019](#); Dinneen and Julien, [2019](#); Fitchett et al., [2013](#); Gori et al., [2020](#); Henderson, [2005](#); Henderson and Srinivasan, [2009](#)). Oh provides one of limited examples of studying personal information management as a more fluid ecosystem (Oh, [2012a](#), [2012b](#), [2013](#), [2019](#)), contributing to an understanding of the stages of personal information categorisation, particularly the need for temporary digital storage locations while records are in active use (Oh, [2012b](#), [2013](#), [2019](#)). They used the terms *Rigid* (such as preferring mutually exclusive categories), *Fuzzy* (a holistic perspective on personal information management) and *Flexible* (structured, but allowing overlapping and changing categories) to describe mindscapes relating to personal information management categorisations (Oh, [2017](#); Oh and Belkin, [2015](#)). This observation of user-subjectivity in how and where people save documents was confirmed in a 2020

study which found that people in a negative mood save records in a more analytic structure than those in a positive mood (Whittaker and Massey, [2020](#)). In his book, *Keeping found things found*, Jones describes personal information management as being, amongst other things, ‘*about managing the ... flow of information*’ ([2008](#), p. 5). Oh created a *Process of Organizing Personal Information* model that described decision making about information in the workplace (Oh, [2013](#), [2019](#)).

Recent research has begun to bridge the gap between current workplace and home personal information management practices, and *ideal* practices (Alon and Nachmias, [2020b](#)). This research examined aspects and levels of activity required in order to determine which practices most effectively establish satisfaction with one’s own personal information management (Alon et al., [2020a](#); Alon et al., [2020b](#); Alon and Nachmias, [2020a](#), [2020b](#)). Studies have also explored workplace team access to and classification of information (Barreau, [1995](#); Barreau and Nardi, [1995](#); Cushing, [2012](#)). Bergman et al. observed a *user-subjective* approach which recognised attributes of personal information management records that may be specific to individual users, such as importance and context (Bergman et al., [2003](#), [2008](#)). Alon and Nachmias’ exploration of the affective aspects of personal information management categorises emotional reactions with terms such as *anxiety*, *frustration* and *desperation*, concluding that research in this area ‘*could suggest ways to improve the design of [personal information management] platforms*’ (Alon and Nachmias, [2020a](#), p. 9).

## The guided tour method

Of significance to our research is the use of the guided tour method of data collection. The guided tour is commonly conducted in the workplace, where participants show the researcher around their physical workplace, including their desktop, as well as electronic files and e-mail (see, for example, Boardman and Sasse, [2004](#); Everett and Barrett, [2012](#); Malone, [1983](#); Thomson, [2015](#)). Thomson described it as:

a hybrid visual-aural strategy, and entails a relatively shortened, planned entry into a field site by a researcher. During this visit, a participant will lead the researcher through some personally meaningful location therein and, while doing so, describe and explain features of the space, think-aloud ideas, thoughts, and feelings to which it gives rise, and respond to gentle inquiries. (Thomson, [2015](#), p.1)

Malone ([1983](#), p. 100) conducted one of the first personal information management studies, interviewing ten people in their workplace, essentially requesting a tour of their office. Their findings distinguished between *neat* and *messy*, describing an environment where icons were used to remind people of documents pending classification, and where information can be easily retrieved. Using the same guided tour method, Kwasnik ([1989](#), [1991](#)) observed that, amongst academics, documents can be sorted in ways appropriate to different types of users, for example, into those requiring immediate action and those required for future use. Workplace personal information management research has classified people’s filing practices into *filers* who file records as soon as they are not in active use, *non-filers* (*filers*), *spring cleaners* who put records into piles and periodically do filing, and *frequent filers* who put records into piles, but file these before the piles become large (Whittaker and Hirschberg, [2001](#); Whittaker and Sidner, [1996](#)).

## E-mail for information management

Discourse shows that one of the most common tools for effectively managing personal information management is e-mail (Whittaker et al. [2006](#); Whittaker, et al., [2011](#); Whittaker and Sidner, [1996](#)). One component that may be particularly pertinent to the aim of understanding personal records management at home is the discussion and research regarding the use of e-mail as a de-facto personal information management tool (Ducheneaut and Bellotti, [2001](#), p. 37). The e-mail in-box has been adopted as a to-do list (often supported by e-mailing to oneself), taking advantage of the fact that e-mail can accommodate a wide variety of personal records and can also be sorted into folders (or tagged or labelled) and searched (Whittaker et al., [2007](#)). E-mail can add context to attached documents and provides for sharing of documents and communications, which helps with task management (Wang et al., [2019](#); Whittaker et al., [2006](#)). Studies have identified the role of saving and re-finding e-mail messages as a part of personal information management (Alrashed et al., [2018](#); Bergman and Yanai, [2018](#); Bruce et al., [2004](#)).

A paper in 2018 further used the terms *push* and *pull* information, describing push records as those requiring no action by the user (such as advertising text messages, or e-mails received spontaneously), as opposed to



records received as the result of a user action such as asking for information (Klumpe et al., [2018](#), p. 572). Additional research investigated whether e-mails were retained in a similar folder structure to computer files (Gwizdka, [2004](#); Henderson, [2009a](#), [2009b](#); Whittaker and Hirschberg, [2001](#); Whittaker and Sidner, [1996](#)). It was recognised that these practices were becoming increasingly important for users in order for them to be able to re-find the documents they required and to be reminded of the tasks relating to those records as they fell due. E-mail can therefore be considered an integral component of personal information management.

## Records management

Our area of interest and research also draws from a different field of study: records management and specifically records management at home. Records management contributes to the definition of the breadth of records that people deal with at home. The field of records management therefore provides a perspective on personal records at home that is not discussed in the study of personal information management in the workplace; that perspective being the nature of the information and documents themselves. These records can comprise a variety of formats such as computer files, photographs, memos, e-mails and instant messages (Bosse, [2015](#); Finnell, [2011](#), p. 2).

The Society of American Archivists define records as ‘*data or information stored on a medium and used as an extension of human memory or to support accountability*’ in the first instance, with more than fifty types of records, including ‘*graphic records, narrative records and housekeeping records*’ (Society of American Archivists, [2020](#)). In relation to personal records, McKemmish ([1996](#), p. 178, 184) coined personal recordkeeping as records that are evidence of me, suggesting that, so long as the record is retained, it forms part of a personal archive making it a record, no matter how trivial it may appear to others. This form of perspective on personal records is supported by personal information management studies that have included the use of micro-notes and reminders to self (Bernstein et al., [2008](#); Levy, [2001](#)). In the same way that Briet ([2006/1951](#)) defined a document as anything that forms part of a collection, personal records are not so much defined by what they are, but because they are retained, whether that be a to-do list or a shopping list. The use of the word records in this context is further supported by Bass, who describes the lifetime ‘*day after day*’ accumulation of records in a digital form as ‘*personal digital records*’ (Bass, [2013](#), p. 49, 54).

## Digital archiving

The study of personal records management at home also overlaps with study of personal digital archiving but may differ in time frames and formats (McKemmish, [1996](#); Yeo, [2018](#)). Personal digital archiving addresses long-term curation of personal documents ‘possibly beyond an owner’s lifetime’ (Kim, [2013](#)). Households continue to maintain at least some documents in hardcopy, such as passports and birth certificates.

The long-term storage or preservation of personal documents in a digital format in the home environment is frequently referred to as personal digital archiving (Kim, 2013, p. 153) or curation (Whittaker, [2011](#); Williams et al., [2009](#)). Such personal information is often stored in a distributed way ‘on the hard drives of different home and work computers, on removable storage media, on remote servers, on personal devices, and printed as hard copy’ (Marshall, [2007](#), p. 63).

Personal archiving focuses on long-term curation of heritage, stories, photos and other records that are to be passed on to future generations (Hawkins, [2013](#); Kim, [2013](#)). Personal digital archives are the ‘*digital equivalent of “personal papers”*’ (Williams et al., [2009](#), p. 341). Williams et al. described three possible actions for personal curation of information and documents in the short term:

Keeping: comprising the active classifying and/or organising of digital items for saving;

Leaving: comprising the conscious leaving of a digital item in place, on the basis that it can be readily re-found where it is; and

Ignoring: wherein information is expected not to be required again. (Williams et al., [2009](#), pp. 350-351)

These typologies are similar to those found in personal information management, however personal archiving tends to focus on the choice of where to store information, and is influenced by the changing technology and whether people are aware of the vulnerability of their devices to loss or damage, as well as the impact of the increasing use and reliance on cloud services for personal information and document storage (Odom et al.,

[2012](#), p. 1; Odom et al., [2011](#)). McKemmish ([1996](#), p. 176) drew a parallel between records management and personal archiving.

## Summary of related work

In summary, the existing literature in personal information management, records management and personal digital archiving each contribute to the study of personal records management at home. Personal information management provides innumerable studies on file saving, the use of folders, searching versus browsing to find items, and similar behaviour within e-mail. However, studies in personal information management predominantly focussed on how to effectively manage and share digital information retained in the workplace and particularly amongst knowledge workers (Buttfield-Addison, [2014](#); Henderson, [2004a](#), p. 9; Oh, [2013](#)). Both records management and digital archiving help us scope the range of information and documents that people are dealing with in their everyday life and the former study provides us with a collective term for these items: records. Finally, personal information management also provides a precedent for the use of the guided tour method of research.

## Method

This research adopted a qualitative approach using semi-structured interviews, which included a virtual guided tour of the participants' records, their physical desktop, electronic files and e-mail. Participants were recruited via Facebook invitation posts as this provided access to participants outside of workplace and study channels. Participants were recruited using an affinity network approach of the primary researcher. A short screening questionnaire was used to achieve a combination of genders and age groups. Interviews were conducted using Facebook Messenger, as this communication tool was available to the Facebook users recruited to this study. The interviews took approximately forty minutes each. Virtual guided tour interviews were appropriate because this research was conducted during the COVID-19 pandemic when personal contact was discouraged (June 2020) and there were ethics and safety concerns about the researcher being in people's homes. In addition to seeing one another during the interview, participants were able to use the camera on their device to show the researcher their physical desktop, files or computer screen.

When people were invited to participate in this research they were asked if they would prefer to do so on their own or with a partner. Twenty-two interviews were conducted, of which eight were with couples, resulting in a total of thirty participants. Of the twenty-two interviews, nineteen were conducted with participants in Australia because the researchers were based in Australia. One interview was conducted with a participant in the United States, and two with people in the United Kingdom, in order to identify any differences, such as terminology used in other English-speaking countries. The profile of participants is described here to show the mixture of people in the study but is not statistically significant due to the small sample size. Of the thirty participants, eleven were aged 18-49 and seventeen were aged 50 and over. Fourteen were male and sixteen were female. While this provided a mix of views and observation amongst younger and older adults, and amongst men and women, it was not necessarily representative of the broader population, the impact of which is unknown.

Participants were prompted to discuss records such as bills, statements, insurance policies, vehicle registration documents or any other records sent to them. They were asked to provide examples of the items they received. A prompt list was used to suggest records that are ubiquitous (such as an electricity bill) if these were not mentioned spontaneously. Participants were asked how they generally received regular records such as bills and statements, and how they processed and saved records. There were two components to the analysis. The first was a qualitative analysis of the participants' verbatim responses and observations of both physical papers and files, and electronic records as shown on-screen during the virtual guided tour interviews. This part of the analysis was reported qualitatively using quotations to illustrate the behaviour and experiences of participants. Additional analysis was conducted on the attributes of the records themselves; this is reported elsewhere.

## Analysis

This paper reports how the participants managed their personal records at home, comprising the responses, comments and explanations provided by the participants, and particularly the different steps that participants applied to the records that they described. The comments and observations are reported without quantitative interpretation. A systematic approach was used for the categorisation of specific records that the participants described and what they did with them. During the course of the guided tour interviews, participants were asked about the steps involved in managing each type of record they described. Their responses were recorded in a spreadsheet. The most steps recorded for a single record was seven. At the analysis stage, these notations were cleaned to use consistent descriptors for like actions, such as saving a record into a folder, making a payment relating to the record, ignoring it, or deleting it. Once the data were coded, a limited set of actions emerged that applied to all the records encountered in this research and enabled the development of a flow that catered for all the scenarios encountered.

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## Results

The results are drawn both from what participants said and from observations made during the interviews. Participants were able to describe behaviour such as where they saved items, who they shared them with and so forth. By showing the researcher their physical in-trays, notes on their desk or computer folder structure, the researcher was prompted to ask further questions that might otherwise not have been raised based on the verbal responses alone. For instance, a verbal description of keeping paper records in a file may not have mentioned that the file was subdivided into sections with labels. Additionally, and to some extent more usefully, by asking participants to show the researcher items, the participants themselves were reminded of their own practices that they may otherwise have forgotten. For instance, one participant only remember that they had sorted e-mails into folders when they looked in their own e-mail as part of the research. By showing items to the researchers, participants were motivated to add explanations that may not have been offered in a less visual method. For example, on several occasions, participants showed piles of physical items that they apparently felt were embarrassingly large, offering explanations of why they had let the pile get larger than they may have felt was good practice. While efforts were made to deter participants from feeling a sense of judgement, the virtual guided tour interview method gave rise to spontaneous self-evaluative comments.

The following reports on the forms of records that people retain at home, some of the issues relating to ensuring records are retrieved from service suppliers, the tools and behaviour that people adopt for managing personal records and the various steps that records may progress through before reaching their final storage place. The discussion that follows compares our findings to those of personal information management in the workplace identifying commonalities and novel findings.

### Household records management

Irrespective of whether one or two people participated in the interviews, participants who lived with other people nominated one person as the main manager of household records such as bills. One participant described the sharing of home information and documents in these words:

That's the current pile... he does most of the household bills and things, but I still do my own which is like health, medical, work-related things.

In the instance of couples that received most of their bills electronically and the couple had individual personal e-mail addresses, then whoever's e-mail address was nominated for receiving the bills was the main bill manager:

I switched quite a few of the bills to electronic copies so I no longer know and it's historic as [name] said in some cases we had one e-mail address and we used that one which is now his.

The combination of what participants said, and the way in which participants in couple interviews deferred to one another on various topics, indicated that, while both members of the couple were familiar with the process used for managing household information and documents, only one of each couple was the main manager of the system.

## **The need for improvement**

A need for improvement in how people managed their personal records was evident from the research in two ways. Firstly, some respondents expressed dissatisfaction with their own personal records management, and secondly the researcher observed an inefficiency or risk that was not always apparent to the participant.

Some participants expressed dissatisfaction with how they managed their personal records in broad terms. For instance, amongst the small number of participants who had no ordered filing system and who had a pile of papers, all stated that their system was poor. For example:

It's a disaster. I come back and find it. Because I have never learnt about – I know there's folders and things aren't there for your e-mails, that you can use. Well, I don't use that, I should, but I don't... I don't keep them there for ever.

Others expressed a specific shortcoming, such as knowing that they could sort records into folders but not doing so, having more e-mails in their in-box than they wished, or in one instance, that they had 'a bad habit of keeping about a thousand Safari pages open on my phone' in place of having a way of saving information from each of the Web pages. The most common indication of a problem was expressed as an intention to sort out papers, e-mail or other records, but not getting around to it:

In the drawer at the present time we have some loose papers, which are some drawing we had done by an architect recently, I haven't actually got around to putting that into a folder.

Additionally, participants expressed shortcomings with certain aspects of their record management, illustrated by comments such as:

We put our donations in there and I kind of had the thought of well do I look at them again in case I ever want to claim them back on tax or do we not really worry about it' That's a bit of a problem, I have to say, sometimes I search for things that I know should be coming, and sometimes I might miss them.

In combination, we heard or observed the following behaviour:

- Leaving all in-bound e-mail in the inbox.
- Relying exclusively on e-mail to store records that come by e-mail.
- Inability to re-find items.
- Overlooking tasks and payments.
- Not reviewing bills or statements.
- Not downloading documents provided by means of a hyperlink.
- Not claiming eligible tax deductions.
- Duplication of paper and electronic filing systems.
- Relying on memory to pay bills and other obligations, and
- labour intensive methods for saving records.

These are discussed below.



## Electronic and hardcopy records

Comparing how people managed personal paper and electronic records, it was observed that, despite differences in how this needs to be done physically versus electronically, the intention is the same. For instance, a reminder note relating to a paper record such as a bill can be written on the paper itself, whereas a reminder for an electronic bill is typically written elsewhere, such as an electronic to-do list.

For each record that people received, they were asked whether it came to them in hardcopy or electronic format. The format of personal records at home was dictated by how people usually received those records, either as hardcopy through the post or by e-mail, or, in some instances, by text message. While some participants spoke of trying to reduce the number of paper documents that they retained by opting into electronic transmission, there were three circumstances where participants preferred to receive records in hardcopy: records that people thought they needed to retain in hardcopy (such as tax related documents, vehicle registration documents); records that people wanted to check (such as credit card statements) and records for which participants were not confident of receiving or noticing the electronic version (such as bills that needed to be paid, as opposed to bills paid by direct debit or autopay). As one participant put it:

The credit card [statement] comes in paper just purely because we want a paper record...I tend to look at the credit card and I mostly look for taxation related entries and for the odd ones, like large numbers – woah.

Nevertheless, there were cases when records were received in hardcopy because the participant had not got around to, or did not know how to convert the record transmission to electronic:

quite frankly, I don't need the paper copy, but I haven't figured how to switch it off.

One category of record that was commonly converted from hardcopy to electronic was receipts. Paper receipts (particularly heat-printed receipts that quickly fade) were frequently photographed in order to dispose of the original paper version. These receipts may be retained as photos amongst other photographs stored in the cloud or e-mailed to the user, particularly if they used their e-mail as their records management system.

## Reminders and micro-notes

We found a variety of methods used by participants to remind themselves to address records that require an action such as a payment that needed to be made. These included:

- A reminder process within e-mail: this usually involved marking a record as unread, using a flag, or sending themselves an e-mail.
- Paper reminders such as a paper to-do list, a post-it note, or in a calendar or diary.
- Electronic diary reminders, allowing users to choose a specific day to be reminded; and
- a reminder in an electronic to-do list or notes app.

Reminders and micro-notes differ from the records traditionally studied in personal information management in two ways: first they may not comprise documents or files, but rather items of text within a document or an application, and secondly, they can be both a new record and a reminder. A to-do list may include a combination of new records and reminders related to records that are also elsewhere, such as an e-mail inbox.

## Push and pull notifications

- Pull only: generated within the bank Web portal, with no notifications.
- Push and pull: statements generated within the bank Web portal, with an e-mail notification but with no attachment, thereby requiring that the recipient actively retrieves the document, usually by means of clicking on a hyperlink and often with additional security required such as a password; and
- push: statements provided by means of e-mail attachment (irrespective of whether it is also available within a Web portal).

Some participants said that they did not retrieve statements provided via pull:

I find bank statements to be irrelevant, to be honest... because I can look at my account now in real-time... I find the whole need for bank statements fairly redundant. I can't really remember receiving bank statements to be honest, If I do, I don't check 'em.

## Personal information and document management practices and behaviour at home

Using the virtual guided tour method, we were able to observe and describe how participants managed hardcopy records compared to how they managed records on a computer or mobile phone. While the detailed actions differed between the two forms of records, the intent of each of the actions was often similar. When paper records arrive, they go into a pile of records to be dealt with. For one participant that comprised a tray in the kitchen which acted as the family to-do list. Records requiring action may be attached to the fridge with a magnet, but commonly, a small pile forms on a desk, which is dealt with periodically, such as once a week. Some records are added to specific piles, files or boxes for less frequent events such as quarterly income reporting or estimated tax, or annual income and tax reporting.

In the case of paper records, the many possible actions are summarised as follows (including duplication of several of these actions for any given record):

- The record elicits an action, such as being read, being checked for accuracy, being discussed with another person, or a payment is made.
- A notification is made on the record, such as writing a reminder note, date, or receipt number.
- A notation is made elsewhere, such as in a diary or calendar, a paper or electronic to-do list, or in some other software, such as notes, a spreadsheet or budget software.
- The record is put in a pile, such as a to do pile, or a pile for filing or sending to someone else.
- The record is shown to someone else in its current format.
- The record is scanned or photographed, such as for electronic storage or forwarding; and/or
- the record is disposed of.

Like paper records, many of these actions are done in tandem for electronic records:

- The record elicits an action, such as being read, being checked for accuracy, being discussed with another person, or a payment is made.
- A notation is made elsewhere, such as in a diary or calendar, a paper or electronic to-do list, or in some other software, such as notes, a spreadsheet or budget software.
- The record is re-labelled, such as by making as read, unread, tagged, or moved to an e-mail folder.
- The record is shared in its current format, such by forwarding to someone else, in the same format in which it arrived.
- The content of the record is shared or saved in a new format, such as that an attachment from an e-mail is saved outside of e-mail, the content is copied and pasted to a new format, such as into a Word file, the record may be turned into an image by means of a screen clip or screen shot, and saved as an image or in another file format, or the record may be printed.
- The record is deleted; or
- the record is ignored and left in the in-box.

Comparing the steps through which personal paper records are processed versus electronic records, it can be seen that the range and purpose of each step is similar between the two forms, but the physical execution of those steps may be different, such as an electronic to-do list in contrast to fridge magnet notes mentioned above.

A distinction is drawn between records requiring an action, such as payment, and those associated with an automated action, such as bills paid by direct debits or autopay. Records managed by direct debit or autopay may be reviewed and then filed, filed without being looked at, or ignored, while those requiring payment demand attention by a specific time. Hardcopy documents might go into different piles on a desk, depending on whether such an action is required. In some cases, participants moved actionable e-mail records into e-mail folders before dealing with them, relying on their unread status or another indicator (such as a flag) to remind them to action the record later.

One contrast found between the processing of hardcopy records and electronic records was the absence of an electronic equivalent of an out-tray. In the physical world, actionable records start in the in-tray, then, once they are dealt with (such as by payment or checking) they are frequently placed in an out-tray which is a temporary storage place for records that have been dealt with but are yet to be filed. When dealing with electronic records, there is no equivalent to this form of out-tray. While flagging or marking a record un-read can equate to in-tray functions, the research did not find a commonly used facility to mark a record as dealt with pending being filed, which perhaps contributes to the propensity to leave things in the in-box indefinitely.

## The use of e-mail for personal information management at home

Irrespective of the e-mail software, users almost always have the option to sort e-mail into groups using folders or tags, and/or to leave the e-mails in their in-box. Participants described two ways of using their e-mail inbox. The first was effectively as a to-do list, wherein records are left in the in-box to remind the user that they need to do something, such as pay a bill. Once the required action has been completed, the record is filed by moving it to a folder or deleted, as are e-mails that require no action. By moving an e-mail from the inbox into a folder (or tagging the e-mail), people who sort their e-mail are effectively re-categorising the e-mail from a to-do item, which is how it is considered when it is in the inbox, to a category, depending on the folder or category allocated to the e-mail. This type of participant described their in-box as '*never having more than 20 records in it*', or '*a screenful*'.

Alternatively, other participants said that they left everything in the inbox, relying on unread notifications, the top of the list, or their memory as to what records need to be dealt with. When participants who left everything in their in-box were asked how they knew which records they needed to deal with, they commonly responded that they dealt with records as soon as they arrived.

Some participants described the challenge of adopting a process of filing records to e-mail folders:

That's why I decided to start using the e-mail like that, because I was so bad with documents, that I wanted to have a way that I can incorporate a hardcopy and electronic data and actually know where it all is. So that's why I made that rule for myself... so it ended up in the Gmail because I was just leaving stuff, forgetting things... and for the most part, I've improved with that.

I do have a few folders, I am just not systematic about it... at one stage I created a folder of receipts, that's when I was being organised, yes, see I can see there's a folder their called receipts, and...oh, actually I did save some things this year [laughter] so I am using it occasionally.

Some participants allowed their e-mail to accumulate cleaned out the completed tasks in their inbox periodically. When asked how many e-mails a participant had in their in-box, they replied:

Just the new things, the folders are separate from the in-box... Oh, if I say that right now there's about a thousand because I don't get to them, there's a lot of junk.

An unanticipated finding of this research related to the emergence of e-mails with hyperlinks to a required document as opposed to receiving the document as an attachment to an e-mail (a push record), the implications of which are explored in the discussion below.

## Records in flow

By applying the notation method mentioned in the analysis to each record revealed by respondents, we identified a set of stages through which the electronic records of participants flowed. Most actions were similar for both paper and electronic formats, and can be positioned as stages in a flow for any given personal record. Some stages comprise points when the record is on hold, waiting for someone to review it, waiting to be paid or waiting for fulfilment. On completion of that action, the record moves to the next stage, collectively acting as a flow, not unlike that suggest by Jones (2008). Together, all the flows of managing inbound transactions and records are shown in Figure 1.

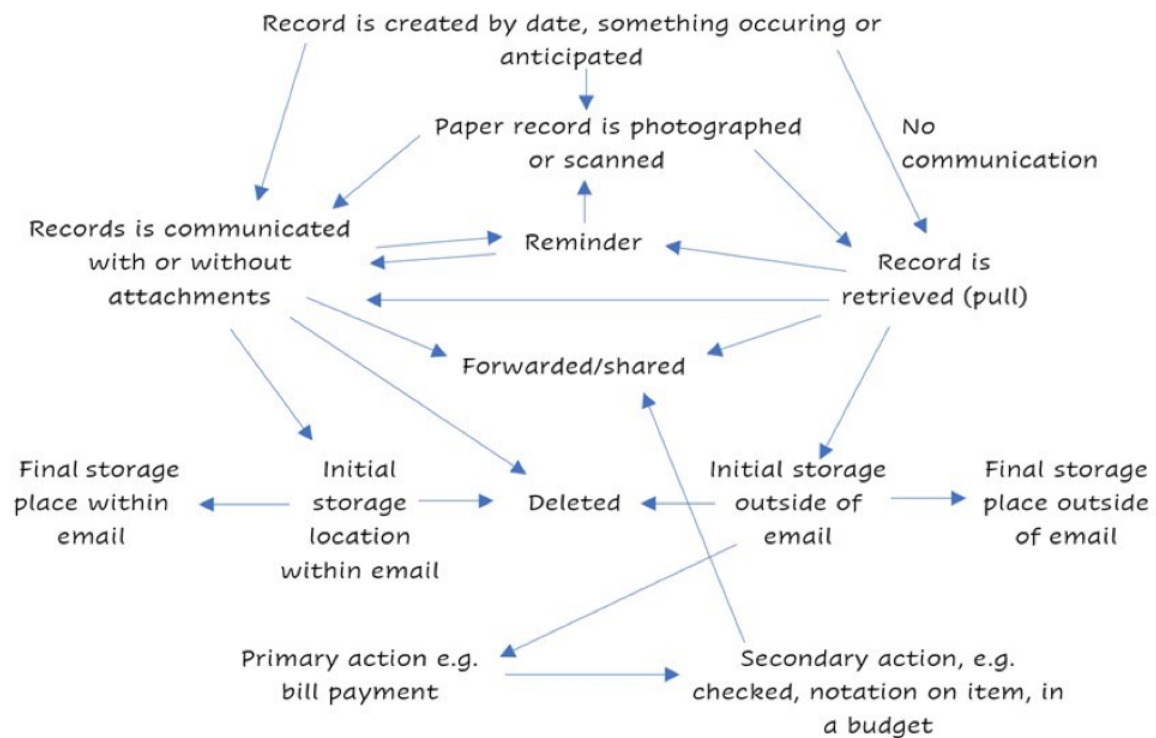


Figure 1: Personal electronic records flow diagram

The paths shown in Figure 1 are formed by the variety of ways in which records are processed and determine where they finally end up: something occurs and a record is created; that event or future event is either communicated or not communicated. Once received, a record may or may not be acted on. Sometimes, the record is deleted. In conjunction with actions taken regarding the record, a reminder may be set in a calendar or to-do list, or a hardcopy notation may be made. For some records, notations may be made in a spreadsheet or elsewhere.

During the flow process described in the Figure 1 flow diagram, the format of a personal document may change. For instance, a paper receipt may be photographed, or content from an e-mail may be copied and pasted into a file. As found in personal information management research conducted in the workplace (Oh, 2013, p. 83), active records may be temporarily kept on the desktop before being moved elsewhere once dealt with. When a record was deemed important to retain, its final storage place comprised either: storage within e-mail (either in an effectively infinite inbox or in an e-mail folder), in a cloud document folder, amongst photos in the cloud, or a file or folder on a computer.

Records stored in files or folders were always stated to be backed up to a USB drive. Hardcopy records were retained in filing cabinets, folders, accordion folders, a fire-proof box, plastic sleeves, boxes or a pile on a desk or similar location. Some hardcopy records were culled after a certain period of time, and one research participant mentioned deleting certain electronic records for reasons of security.

## Discussion

The guided-tour method used in personal information management has been successfully applied to the study of personal records management at home, and it can be conducted virtually, using electronic video interviewing to replace in-person visits as necessary. This exploratory research has provided some answers and unanticipated insights, and as such, contributes an understanding of personal electronic records management, and the range of events that give rise to those records and how they are received and processed. We can identify commonalities and differences between the records and flows identified in the study of personal electronic records management compared with personal information management, personal digital archiving, and records management.

The management of personal records at home is similar to personal information management in the workplace in some respects. For instance, the who of information management in the workplace is a factor of

organisational structure. At home, amongst couples, one or other member of the couple can become the custodian for some or all of the shared documentation such as household bills.

While some participants were dissatisfied with how they managed their personal records at home, others described shortcomings with regards to certain aspects of their records management, and others mentioned or showed us behaviour that may be deficient or subject to risk (Table 1).

Table 1: Risks of personal information management behaviour

Behaviour	Risk
Leaving all in-bound e-mail in the inbox.	Difficulty in finding records.
Relying exclusively on e-mail to store records that come by e-mail.	Filling e-mail capacity, limits ability to change e-mail service provider.
Inability to re-find items.	Difficulties in applying for loans, fulfil tax reporting obligations, difficulty in addressing disputes.
Overlooking tasks and payments.	Late payment fees.
Not reviewing bills or statements.	Un-identified errors or omissions.
Not downloading documents provided by means of a hyperlink.	Inability to access records after changing service provider or employer.
Not claiming eligible tax deductions.	Unnecessary costs.
Duplication of paper and electronic filing systems.	Excess labour, requires storage space, unnecessary use of paper.
Relying on memory to pay bills and other obligations.	Payments and other tasks may be forgotten
Labour intensive methods for saving records.	Time wastage.

There was also some behaviour of subjective benefit or disadvantage, depending on the view of the participant. For instance, some participants were quite satisfied with keeping receipts in Google photos, while others wanted their receipts in a text-based format. Overall, the observed deficiencies in personal records management, when combined with the comments dissatisfied participants made about their records management, indicates a significant opportunity for improvement in the management of personal records for many users.

Considering the combination of observations made in this research, a number of conceptual solutions come to mind for future testing. Firstly, a more consistent format for electronic documents such as bills, with both easier access in order to encourage documents to be downloaded, and easier management systems so that people can choose to receive electronic versions of the documents. Secondly, more consistent ways of managing reminders and to do lists, so that people can consolidate reminders relating to items that have arrived in different formats. Thirdly, the solution for managing personal electronic records needs to cater for more than just where items are saved, and how they are labelled; it needs to be able to move records from one status to another, to cater for the flow through which personal records transition before they are considered to have been dealt with.

We identified three key factors that impact whether people choose to receive records electronically or in hardcopy: 1) whether the recipients wanted to check the record (such as a statement or bill); 2) whether they believed they needed to keep the record for reporting purposes; and, 3) the level of trust they had in digital storage (recognising that there are some records that need to be kept in hardcopy) to save and re-find records they need, adopting techniques such as e-mailing records to themselves.

We also observed several approaches to managing personal e-mail. The first of these was the use of the e-mail inbox as a de-facto to-do list, with records that have been dealt with moved to folders, given tags or labels or deleted (*filers*). This mode of using the e-mail in-box as an information management tool has also been found in personal information management (Whittaker et al., 2006, 2007). The second approach was to leave everything in the in-box, colloquially referred to as the infinite inbox (*pilers*). In personal information management, people who leave their e-mail in the inbox is inferred to equate to people who use the search



function to re-find e-mails, as opposed to sorting e-mails into folders and navigating to them (Whittaker et al., 2011). A third approach was to leave recent in-bound e-mails in the inbox and occasionally move or delete these e-mails when the inbox becomes too large (*spring-cleaners*).

When participants received e-mails with hyperlinks to documents, they needed to log in to access that record, described here as a *pull* record. This definition considers more scenarios than Klumpe et al.'s (2018, p. 572) description of push as unsolicited e-mail and pull as e-mails elicited by a user action. We have used pull to describe an e-mail alert as to the availability of a record wherein the user is required to actively download the item (usually through a hyperlink provided in the e-mail), and push to describe records that are provided as attachments to the e-mail.

With regards to information and document flow, similar descriptors have been made in personal information management (Jones, 2008), although that flow has not been described in personal information management and is sometimes described as a process (Oh, 2012a, 2012b, 2013, 2019). Similarly, records management provides us with the continuum model (McKemmish, 2001; McKemmish et al., 2010), i.e., the notion of records evolving with regards to changes that may occur to them, and the location in which they are stored. Our research provides the first description of stages in the home records management flow. We observed the role of reminders and micro-notes occurring at home, just as they have been observed in previous personal information management research (Bernstein et al., 2008; Butfield-Addison, 2014; Levy, 2001).

In summary, this research shows that the guided tour method used in personal information management research can be applied at home and adapted to a virtual technology. Many of the issues addressed in personal information management research are reflected at home, such as the quandary of using one's e-mail as a host for personal records or saving these elsewhere. However, there are a number of aspects of personal records management at home that are not encountered in personal information management research. For instance, we can see clearer patterns that explain why some items may be preferred in an electronic format versus hardcopy. Another example of these differences is the risk of not pulling down and keeping records from service providers. A further example is that personal records management at home involves a flow with different stages to those discussed in personal information management, such as Oh's *Personal Information Organizing process* (Oh, 2013, 2019).

One limitation of this study was the small sample size, which therefore does not permit statistical reporting. Another limitation was the sensitivity of the topic, as the researcher needed to be careful not to be too intrusive with the participants and their personal records. For instance, the researcher needed to ask questions, see and take screenshots relating to where and how personal records were stored while avoiding seeing the content of those records. Consequently, it is possible that some participants' views or useful observations were not expressed or seen.

## Conclusion

In this study we have drawn on both the guided tour research method developed in personal information management and the findings of those studies, in order to gain a better understanding of personal records management at home, particularly how people manage electronic records in the home. We have found that, like personal information management in the workplace, personal records management at home can be studied by means of the guided-tour method and specifically, a virtual variant, thereby averting the need for in-home visits. We have identified three key factors that influence which documents are retained in hardcopy versus digital only format, checking the record; keeping the record; and the level of trust they had in digital records.

Our research also found commonalities between personal electronic records management at home and personal information management in the workplace, such as the use of e-mail as a tool for managing personal records and the use of folders, tags or labels within e-mail by some users. Like personal information management, personal electronic records management includes micro-notes, reminders and e-mails to oneself in order to bring reminders within the e-mail environment.

There were four findings from our study that are not reported in studies about personal information management in the workplace. First, while participants provided consistent examples of records that they received and dealt with, there was no common word that they used to describe those records. Second, people

at home can choose how items such as bills arrive. For example, they can select to receive records in hardcopy or electronically, a choice that can be dependent on the degree to which the recipient wishes to scrutinise the record. Third, people are able to describe multiple actions that a single personal record may be subjected to; we have been able to identify the range of options through which personal electronic records flow and to develop a simplified flow diagram showing the possible stages that a record can transition through. Fourth, the research identified the issue of pull e-mail communications and the potential risk associated with that form of communication.

Consequently, we suggest three improvements for personal electronic records management:

- A more consistent format for electronic documents (such as bills) which pushes the record out to users, rather than requiring people to download documents via a link would ensure that people retained a copy of the record after the relationship with the service provider or employer was no longer active, thereby ensuring that people can access unanticipated records they may need in the future.
- More consistent software conventions for managing reminders and to do lists, so that people can consolidate new tasks triggered by the arrival of e-mail or other message systems, calendar items and other reminders into a single task list would avert tasks being overlooked.
- Creation of tools for managing personal electronic records that cater for more than just where items are saved and how they are labelled. Tools are needed to be able to move records from one status to another, to cater for the flow through which personal records transition before they are considered dealt with.

These improvements could significantly enhance personal records management at home by ensuring that people had local copies of their records, a single, comprehensive task list, and a way of tracking the status of tasks that are still in progress.

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Note: A link from the title, or from (Internet Archive) is to an open access document. A link from the DOI is to the publisher's page for the document.

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